

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 20

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte UWE BREKAU, HANS-DIETER BLOCK, HANS-HEINRICH MORETTO,  
PETER SCHMIDT, PETER SCHOBER and WERNER LUDOVICI

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Appeal No. 95-2237  
Application 08/067,308<sup>1</sup>

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HEARD: November 6, 1998

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Before KIMLIN, JOHN D. SMITH and WEIFFENBACH, Administrative Patent Judges.

KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claim 1, the only claim in the present application. Claim 1 reads as follows:

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<sup>1</sup>Application for patent filed May 26, 1993.

1. A continuous process for the preparation of aqueous alkaline silica sols which contain non-aggregated, spherical  $\text{SiO}_2$  particles with an average diameter of 27-72 nm, from an acidic fresh sol which contains 4-8% by weight of  $\text{SiO}_2$  in the form of particles having an average particle diameter of about 2 nm at a pH value of 2-4 and which has been prepared by mixing an alkali silicate solution with a cation exchanger resin in the H-form, this acidic fresh sol is added to a starting medium containing an aqueous, alkaline, colloidal silica sol solution having a pH value of  $>8$ , a  $\text{SiO}_2$  content of 2-20% by weight and an average particle size of 14-27 nm, alkaline agents are added to this medium at temperatures near the boiling point thereof in such quantities that the pH value does not fall below 8 during the whole process, and the addition of acidic fresh sol and alkaline agents is continued until the particles have an average diameter of 27-72 nm and the aqueous, alkaline silica sols thus prepared are concentrated, characterised (sic) in that

a) the acidic fresh sol is continuously introduced into the reactors of a multi-stage reaction cascade, in which the first stage contains the starting medium and each successive reactor of the cascade is supplied with overflow from the preceding reactor, and the pH value in the reactors must not fall below 8,

b) alkaline agents, preferably alkaline sodium silicate solution, alkaline potassium silicate solution, sodium hydroxide solution, potassium hydroxide solution, are continuously introduced into the first reactor or into the first reactors in such a quantity that a pH value of 8

Appeal No. 95-2237  
Application 08/067,308

to 12.5 is established in the reactors thus charged,

c) the average residence times in the stages of the reaction cascade charged with acidic fresh sol are adjusted in such a manner that an average particle size of 27-72 nm is obtained in the last reactor of the cascade.

The examiner relies upon the following references as evidence of obviousness:

Weldes et al. (Weldes)	3,440,175	Apr. 22, 1969
Leutner et al. (Leutner)	4,336,234	Jun. 22, 1982

Appellants' claimed invention is directed to a continuous process for the production of aqueous alkaline silica sols with SiO<sub>2</sub> particles having an average diameter of 27-72 nm. The process entails preparing an acidic fresh sol having SiO<sub>2</sub> particles with an average diameter of about 2nm by mixing an alkali silicate solution with a cation exchanger resin in the H-form, and then adding the acidic fresh sol to a starting medium containing an aqueous, alkaline, colloidal silica sol solution having an SiO<sub>2</sub> content of 2-20% by weight and an average particle size of 14-27 nm. The continuous process is carried out in a multi-stage cascade reactor by continuously introducing the acidic fresh sol into the reactor wherein the

first stage contains the starting medium.

Appealed claim 1 stands rejected under 35 USC § 103 as being unpatentable over Weldes in view of Leutner.

Upon careful consideration of the opposing arguments presented on appeal, we agree with appellants that the prior art applied by the examiner fails to establish a *prima facie* case of obviousness for the claimed subject matter. Accordingly, we will not sustain the examiner's rejection.

Appellants submit on page 3 of the brief that although Weldes refers to the disclosed process as a "continuous" one, the reference does not actually describe a true continuous process, i.e. one that achieves steady-state conditions. According to appellants, the examples and claim 4 of Weldes illustrate that the reference employs a batch process rather than a continuous process. The examiner, on the other hand, rather than offer a critical refutation of appellants' analysis of the Weldes process, simply adheres to Weldes' use of the term "continuous". Accordingly, at issue left for our resolution is whether the combined teachings of Weldes and Leutner establish the obviousness of a continuous process of

the type claimed.

The examiner recognizes that Weldes does not teach the use of the claimed multi-stage reactor. According to the examiner, Leutner's use of a multi-stage cascade reactor to produce alum-inosilicate suspensions would have made it obvious for one of ordinary skill in the art to use such a cascade reactor in the process of Weldes.

We cannot sustain the examiner's position because, in the face of appellants' argument, the examiner has not established either a close correspondence between the specific process steps of appellants and Weldes, or that one of ordinary skill in the art would have considered the multi-stage cascade process of Leutner, which is directed to the preparation of silicate suspensions, a suitable process for preparing aqueous alkaline silica sols. In our view, the examiner's rejection is tantamount to saying that it would have been obvious for one of ordinary skill in the art to use any known, conventional continuous reactor in the process of Weldes. However, there is a distinct lack of evidentiary support for such legal conclusion.

Appeal No. 95-2237  
Application 08/067,308

Also, the claimed process requires that the starting medium is a colloidal silica sol containing at least 2% by weight of  $\text{SiO}_2$ . However, the starting material of Weldes is an alkaline solution that "may contain no silica at all or merely that which results from using an alkali silicate solution diluted to the desired pH." (col. 2, lines 21-23). Hence, although the starting material of Weldes may apparently contain some incidental silica, the examiner has not established that it would have been obvious

from the teaching of Weldes to employ a starting material that is a silica sol having the claimed  $\text{SiO}_2$  content of 2-20% by weight. In particular, the examiner has not made out the case that by following the teachings of Weldes for forming a starting material, the claimed starting material containing a silica sol solution having the recited amount of  $\text{SiO}_2$  would necessarily, or inherently, result.

In conclusion, based on the foregoing, the examiner's decision rejecting the appealed claim is reversed.

REVERSED

Appeal No. 95-2237  
Application 08/067,308

EDWARD C. KIMLIN	)	
Administrative Patent Judge	)	
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	)	BOARD OF PATENT
JOHN D. SMITH	)	APPEALS AND
Administrative Patent Judge	)	INTERFERENCES
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CAMERON WEIFFENBACH	)	
Administrative Patent Judge	)	

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Appeal No. 95-2237  
Application 08/067,308

Sprung, Kramer, Schaefer & Briscoe  
660 White Plains Road  
4th Floor  
Tarrytown, NY 10591-5144